

weather, at other times colder weather. If each observer will record the time at which the winds and clouds change direction, and will also record either the temperatures or the fact of changes from cold to warm, he will enable the student of this matter to draw systems of lines showing the front of the chinook and the opposing front of the cold wave at any time. It is believed that between these two fronts there is an intermediate belt of neutral ground that may be 5 or 50 miles wide, the location of which is important in regulating the display of cold wave signals. The chinook appears sometimes to pass overhead over a broad strip of country and descend some distance beyond, but is eventually pushed back to the mountains. Thus in November, 1894, the chinook began at Havre (Fort Assiniboine), 60 miles northeast of Fort Benton, on the 13th at 11 p. m., but at Helena, southwest of Fort Benton, on the 14th, at 9 a. m. In this case the whole northwestern corner of Montana was first filled by the warm southwest chinook, which was then pushed southward by underflowing cold northwest winds from Alberta.

The study of the exact extent and progress of the chinook is hindered by the fact that many of our voluntary observers

fail to make a complete record of the phenomena that they observe, so that only fragments of knowledge come to our hands, while the observer knows by experience many important local details. The whole subject can best be studied by plotting upon a series of contour maps the detailed records that we hope to receive from our observers in that section.]

CONTRIBUTIONS TO THE WEATHER REVIEW.

In order that all the observers and officials of the Weather Bureau may profit by the numerous interesting observations that are frequently made in distant parts of the country, the Chief of the Bureau has authorized the issue of a circular letter, No. 17, of 1895, from which the following extract is made:

By direction of the Chief of Bureau, I am requested to say that any short article that you may desire to offer for publication in the MONTHLY WEATHER REVIEW will be taken into favorable consideration. Papers that are too technical for publication in the daily newspapers or popular journals, or in the monthly bulletins of the State Weather Services, or those that relate to matters of general rather than local interest, are appropriate to the MONTHLY WEATHER REVIEW.

If the article should not be accepted for the REVIEW, it will be returned to you, with such suggestions, relative to its publication, as may seem proper to the Chief.

METEOROLOGICAL TABLES.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

Table I gives, for about 130 Weather Bureau stations making two observations daily and for about 20 others making only the 8 p. m. observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation.

Table II gives, for about 2,400 stations occupied by voluntary observers, the extreme maximum and minimum temperatures, the mean temperature deduced from the average of all the daily maxima and minima, or other readings, as indicated by the numeral following the name of the station; the total monthly precipitation, and the total depth in inches of any snow that may have fallen. When the spaces in the snow column are left blank it indicates that no snow has fallen, but when it is possible that there may have been snow of which no record has been made, that fact is indicated by leaders, thus (. . .).

Table III gives, for about 30 Canadian stations, the mean pressure, mean temperature, total precipitation, prevailing wind, and the respective departures from normal values. Reports from Newfoundland and Bermuda are included in this table for convenience of tabulation.

Table IV gives, for 29 stations, the mean hourly temperatures deduced from thermographs of the pattern described and figured in the Report of the Chief of the Weather Bureau, 1891-'92, p. 29.

Table V gives, for 28 stations, the mean hourly pressures as automatically registered by Richard barographs, except for Washington, D. C., where Foreman's barograph is in use. Both instruments are described in the Report of the Chief of the Weather Bureau, 1891-'92, pp. 26 and 30.

Table VI gives, for 186 stations, the arithmetical means of the hourly movements of the wind ending with the respective hours, as registered automatically by the Robinson anemometer, in conjunction with an electrical recording mechanism, described and illustrated in the Report of the Chief of the Weather Bureau, 1891-'92, p. 19.

Table VII gives the danger points, the highest, lowest, and

mean stages of water in the rivers at cities and towns on the principal rivers; also the distance of the station from the river mouth along the river channel.

Table VIII gives the maximum, minimum, and mean readings of the wet-bulb thermometer for 135 stations, as determined by observations of the whirled psychrometer at 8 a. m. and 8 p. m., daily.

The difference between mean local time and seventy-fifth meridian time is also given in the table.

Table IX gives, for all stations that make observations at 8 a. m. and 8 p. m., the four component directions and the resultant directions based on these two observations only and without considering the velocity of the wind. The total movement for the whole month, as read from the dial of the Robinson anemometer, is given for each station in Table I. By adding the four components for the stations comprised in any geographical division one may obtain the average resultant direction for that division.

Table X gives the total number of stations in each State from which meteorological reports of any kind have been received, and the number of such stations reporting thunderstorms (T) and auroras (A) on each day of the current month.

Table XI gives, for 38 stations, the percentages of hourly sunshine as derived from the automatic records made by two essentially different types of instruments, designated, respectively, the thermometric recorder and the photographic recorder. The kind of instrument used at each station is indicated in the table by the letter T or P in the column following the name of the station.

Table XII gives the records of hourly precipitation as reported by stations equipped with automatic gauges, of which 37 are known as float gauges and 7 as weighing rain and snow gauges.

Table XIII gives the record of excessive precipitation at all stations from which reports are received.

Table XIV gives a record of the heaviest rainfalls for periods of five and ten minutes and one hour, as reported by regular stations of the Weather Bureau furnished with self-registering rain gauges.

Additional information concerning the tables will be found in the January, 1895, REVIEW.